

Appl. No.: 10/706,273  
Amdt. Dated: January 7, 2005  
Reply to Office Action of: November 24, 2004

### **REMARKS/ARGUMENTS**

Claims 1-5 have been withdrawn. Claims 6-9 and claims 14-20 have been cancelled. Claims 10-13 are currently amended. Claims 21-36 have been added. Claims 10-13 and claims 21-36 remain in this application.

Applicant affirms the election of group II, original claims 6-20. In view of the Examiner's earlier restriction requirement, Applicant retains the right to present original claims 1-5 in a divisional application.

Applicant has amended claims 10-13 in accordance with the Examiner's suggestions as to allowable subject matter. The Applicant submits that these claims are now in condition for allowance.

Applicant has cancelled claims 6-9 and claims 14-20 without prejudice. This renders the Examiner's objections to these claims moot.

Applicant has added new claims 21-36. Support for these claims can be found in the specification as originally filed.

Applicant submits the following comments on the cited prior art.

#### **Nakano (US 4,753,283)**

1. Nakano is not directed to the re-cycling of scrap magnesium.
2. Nakano does not discuss the formation of solid magnesium scrap anywhere in the specification and, as a result, does not suggest the re-introduction of scrap into a re-melt furnace.
3. Nakano does not disclose a re-melt furnace anywhere in the specification. Nakano further does not disclose a magnesium die casting system having both a re-melt furnace and a casting furnace. Nakano therefore cannot disclose a re-melt furnace in fluid communication with a casting furnace.
4. Accordingly, Nakano does not teach fluid communication between a re-melt furnace and a casting furnace through a U-shaped tube. Referring to the Examiner's comments on claim 14, the structure 3 in Fig. 1 is described by Nakano at column 2 line 26 as a "storage vessel". A storage vessel is not an analogous structure to either a re-melt furnace or a casting furnace.
5. The Examiner indicates, in reference to original claim 15, that the figure shows transfer of molten metal from the furnace 6 to the storage vessel 3 by siphoning through the U-shaped tube. This is an incorrect interpretation of the figure. The molten metal level in the storage vessel 3 exceeds the level in the furnace 6; therefore, if the molten metal were transferred by siphoning, it would be transferred in the opposite direction to that described by Nakano, ie:

Appl. No.: 10/706,273  
Amdt. Dated: January 7, 2005  
Reply to Office Action of: November 24, 2004

from storage vessel 3 to furnace 6. The figure therefore teaches away from fluid transfer through the U-shaped tube by siphoning.

6. Nakano does not disclose a pump anywhere in the specification. The passage indicated by the Examiner (column 2, lines 61-65) does not disclose a pump and a pump is not shown in Fig. 1.
7. Referring to new claim 21, Nakano does not disclose a re-melt furnace containing molten magnesium stratified into three regions, nor does Nakano disclose an upper region, a lower region, or a clean region between the upper and lower regions.
8. Referring to new claim 21, the U-shaped tube shown by Nakano does not have an inlet located within the clean region of a re-melt furnace, nor an outlet located within a casting furnace.
9. Referring to new claim 21, Nakano does not disclose a pump for supplying molten magnesium directly to the shot sleeve of a die casting machine.
10. Referring to new claim 21, Nakano does not disclose a re-melt furnace, nor means for re-introducing solid magnesium scrap into the re-melt furnace.

**US 5,388,633 (Mercer II, et al.)**

1. Mercer II does not disclose a re-melt furnace having a plurality of independently controlled heating zones. The disclosure in the figure of resistance heating coils 24 does not amount to a disclosure of a plurality of independently controlled heating zones. Applicant notes that the Examiner has not indicated the specific passage from Mercer II that he is relying upon for the disclosure of a plurality of heating zones, nor for independent control of those zones.
2. Mercer II discloses only a single temperature sensor (70) within the holding pot (10). With a single temperature sensor, there cannot be independent feedback control of a plurality of heating zones.
3. Mercer II does not disclose a re-melt furnace and does not mention any of the temperature control problems encountered in the re-melting of scrap magnesium. For reference, these problems are discussed in the instant specification, *inter alia*, at page 3, lines 13-17 and at page 6, lines 28-30. No recognition of these temperature control problems is provided by Mercer II.
4. Applicant notes that Mercer II is not directed to the re-cycling of scrap magnesium castings. A person skilled in the art would not look to Mercer II for a solution to problems encountered in the re-cycling of scrap magnesium, particularly in maintaining the desired temperature profile in a re-melt furnace.

Appl. No.: 10/706,273  
Amdt. Dated: January 7, 2005  
Reply to Office Action of: November 24, 2004

**US 5,370,171 (Fields, et al.)**

1. The sub-compartment (56) described by Fields at column 12, line 13 is not an analogous structure to the baffles of the present invention. Furthermore, Applicant points out in the instant specification at page 5, lines 1-5 that the baffles may be used to promote a desired temperature profile within the crucible. The sub-compartment (56) does not provide this function.
2. The instant specification discloses not just a filter, but a U-shaped tube comprising a filter. Fields does not disclose a U-shaped tube, and the filter disclosed by Fields is not analogous in structure to the U-shaped tube comprising a filter of the present invention. Furthermore, since Fields is not directed to the re-cycling of scrap magnesium, Fields does not disclose a filter for excluding impurities and/or sludge from a casting furnace; the filter in Fields does not perform the same function as that of the present invention.
3. The Applicant notes that, in the Field of the Invention, Fields states that the invention relates to high-pressure die-casting processes, particularly where vacuum is used to facilitate the die-casting operation. In the instant specification, Applicant specifically points out the shortcomings of these processes for magnesium die casting at page 1, lines 19-24 and at page 2, lines 1-6 and lines 14-17. A person skilled in the art would therefore not look to Fields for a solution to problems encountered in the re-cycling of scrap magnesium. In fact, based on the identified process shortcomings of Fields, the teachings of Fields would lead a person skilled in the art away from the present invention.

.....  
.....  
In view of the above amendment and remarks, reconsideration on all claims is respectfully requested. In the event any matters remain to be resolved in view of this communication, the Examiner is encouraged to call the undersigned so that a prompt disposition of this application can be achieved. Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,  
ANISSIMOFF & ASSOCIATES

Date: January 10, 2005

By Robert A. H. Brunet  
Robert A.H. Brunet  
Reg. No. 55,158  
Tel.: (519) 673-5591